

[29/A-11]

SEAT No. \_\_\_\_\_

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SARDAR PATEL UNIVERSITY  
B.Sc. Examination, Semester VI  
Microbiology ; US06CMIC05

Agricultural and Environmental Microbiology

03.04.19; Wednesday

Time: 10.00 to 1.00 p.m.

Total Marks: 70

Q.1. Select the most appropriate answer.

(10)

1. Anabaena is a cyanobacterium that establishes a symbiotic relationship with
  - (a) lupines
  - (b) beans
  - (c) Azolla
  - (d) all of the above
2. Dinitrogenase reductase protein consists of
  - (a) 2 dissimilar polypeptides
  - (b) 2 identical polypeptides
  - (c) 3 identical polypeptides
  - (d) none of them
3. What is 'Doom' ?
  - (a) a biofertilizer
  - (b) a microbial pesticide
  - (c) an enzyme
  - (d) none of them
4. Xanthan gum is produced by
  - (a) *Xanthomonas citri*
  - (b) *Xanthomonas oryzae*
  - (c) *Xanthomonas campestris*
  - (d) all of them
5. The utilization of microorganisms to remove pollutants from the environment is called \_\_\_\_\_.
  - (a) biomagnification
  - (b) bioremediation
  - (c) bioleaching
  - (d) none of them
6. Which of the following is not involved in the bioleaching of copper?
  - (a) *Thiobacillus thiooxidans*
  - (b) *Thiobacillus ferrooxidans*
  - (c) *Sulfolobus acidocaldarius*
  - (d) *Helicobacter pylori*
7. Protham is a \_\_\_\_\_ herbicide.
  - (a) recalcitrant
  - (b) biodegradable
  - (c) sweet
  - (d) none of the above
8. Biodegradable plastics made of poly (3-hydroxyalkanoates) are commercially produced using recombinant strains of
  - (a) *Escherichia coli*
  - (b) *Enterobacter aerogenes*
  - (c) *Agrobacterium tumefaciens*
  - (d) all of the above
9. Non renewable energy resources contributes \_\_\_\_\_ % needs in developing countries
  - (a) 20
  - (b) 1
  - (c) 40
  - (d) none of the above
10. \_\_\_\_\_ acts as an inhibitor/inhibitors of biogas production.
  - (a) putrescine
  - (b) ornithine
  - (c) acetic acid
  - (d) none of them

(1)

PTO

- Q.2. Attempt any ten out of the following. (20)
1. What is nitrogenase? What is it composed of?
  2. What is the significance of nod genes?
  3. Give four examples of fungi which can be used as microbial pesticide.
  4. How can biodeterioration of paint be prevented?
  5. How can bioremediation of TCE be brought about?
  6. Explain the use of xanthan gum in the tertiary recovery of oil.
  7. Explain with the help of a flow diagram, the fate of chlorinated hydrocarbon in the environment.
  8. Which of the alkanes is degraded most rapidly? Why?
  9. Which is the major component of anionic laundry detergents? What is its mode of action?
  10. Enlist various digesters used in the production of biogas.
  11. Which precautions must be taken during the production of biogas?
  12. Mention any four advantages of biogas.
- Q.3. Write a detailed note on microbial insecticides. (10)
- OR
- Q.3. Describe biofertilizer production with an example in detail. (10)
- Q.4. (a) Write a note on bioremediation of petroleum hydrocarbons. (05)  
 (b) Describe the biodeterioration of metals. (05)
- OR
- Q.4. Describe the bioleaching of copper in detail. (10)
- Q.5. (a) Describe biomagnification with a suitable example. (06)  
 (b) Compare and contrast biodegradation of:  
 (i) 2,4-D and 2,4,5-T (04)  
 (ii) propham and propachlor
- OR
- Q.5. (a) Explain the biodegradation of oil pollutants. (06)  
 (b) Write a note on biodegradable polymers. (04)
- Q.6. Write notes on:  
 (a) Microorganisms involved in biogas production. (05)  
 (b) Disadvantages of biogas production. (05)
- OR
- Q.6. Draw a neatly labelled diagram of a gobar gas plant. Discuss in detail the substrate, chemistry and production of biogas. (10)